AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (previously presented) A signal compression method for compressing an original video signal which has been provided in advance and which is represented as a sequence of multi-dimensional vectors to convert the original signal into a compressed signal, comprising:

an initial sub-signal creation step of creating sub-signals by dividing the original signal into the sub-signals in a time domain so as not to overlap with each other, wherein the original video signal represents a sequence of images of a physical domain captured by an imaging device;

a created sub-signal selection step of, for each of the sub-signals which have been produced by the initial sub-signal creation step, setting a segmentation boundary shiftable range which includes a segmentation boundary between the sub-signals produced by the initial sub-signal creation step, calculating an average value of dimensionality of compressed signals which are obtained from the sub-signals produced by the initial sub-signal creation step, and extracting segmentation boundary candidates from the segmentation boundary shiftable range, the average value of dimensionality of compressed signals which are obtained from sub-signals which are determined by each of the segmentation boundary candidates being smaller than the average value of dimensionality of the compressed signals which are obtained from the sub-signals produced by the initial sub-signal creation step;

a sub-signal re-creation step of determining upon a created sub-signal which is actually to be used, using the segmentation boundary candidates which have been produced by the created sub-signal selection step;

a compression mapping determination step of determining, from only the respective sub-signals which have been produced by the sub-signal re-creation step, different mappings for calculation of a compressed signal corresponding to the respective sub-signals; and

a signal compression step of calculating a compressed signal which corresponds to each of the sub-signals which have been obtained by the sub-signal re-creation step, based upon the mappings which have been obtained by the compression mapping determination step, to reduce the dimensionality of each of the multi-dimensional vectors in each unit time.

2. (previously presented) A signal compression method as described in Claim 1, wherein the signal compression step comprises:

a signal mapping step of mapping each of the sub-signals which have been obtained by the sub-signal re-creation step by the mappings which have been obtained by the compression mapping determination step;

a projection distance calculation step of calculating the distance between the sub-signal after the mapping which has been obtained by the signal mapping step and the sub-signal which has been obtained by the sub-signal re-creation step; and

a compressed feature creation step of creating the compressed signal from the respective sub-signals after mapping which have been produced by the signal mapping step and the projection distance which has been produced by the projection distance calculation step.

3. (previously presented) A signal compression method as described in Claim 1, wherein the initial sub-signal creation step segments the original signal from the beginning of the original signal, and takes the sub-signal after the segmentation as its resulting sub-signal.

4. (previously presented) A signal compression method as described in Claim 3, wherein the created sub-signal selection step and the sub-signal re-creation step determine segmentation boundaries in order from the beginning of the original signal.

5. (previously presented) A signal compression method as described in Claim 3, wherein the created sub-signal selection step and the sub-signal re-creation step set a segmentation boundary shiftable width which is determined in advance, and, taking the segmentation boundary which has been obtained by the initial sub-signal creation step as a reference, determine segmentation boundaries which minimize the amount of the data of the compressed signal within the segmentation boundary shiftable range having the segmentation boundary shiftable width on both sides of the center thereof.

6. (previously presented) A signal compression method as described in Claim 3, wherein the created sub-signal selection step shifts the segmentation boundaries to some locations and calculates compression ratios, and, based upon the results thereof, selects a range in which the segmentation boundaries which minimize the amount of the data of the compressed signal can exist.

7. (original) A signal compression method as described in Claim 6, wherein the created sub-signal selection step automatically determines the number of times for calculation of compression ratio in the created sub-signal selection step, so as to reduce the number of times of calculation of compression ratio in the created sub-signal selection step and the sub-signal re-creation step.

8. (previously presented) A signal compression method as described in Claim 1, wherein the original signal includes features of a given signal extracted from the given signal as the sequence of multi-dimensional vectors.

9. (previously presented) A signal retrieval method for, at any location within a stored signal, which is an original signal which is registered in advance, calculating the distance from a reference signal, which is a signal which is taken as an object, and finding a location from the stored signal which is similar to the reference signal, comprising:

the steps which are comprised in the signal compression method as described in Claim 1;

a reference feature extraction step in which a feature is produced from the reference signal;

a stored feature extraction step in which a window upon which attention is focused is set within the stored signal, and in which a feature is produced from the stored signal within the window upon which attention is focused;

a reference feature compression step in which a reference feature which has been produced by the reference feature extraction step is compressed, based upon the mappings which have been produced by the compression mapping determination step;

a feature matching step in which the distance is calculated between a reference compressed signal which has been produced by the reference feature compression step and a stored compressed signal which has been produced from the signal compression step by newly using the feature sequence which has been produced by repeatedly performing the processing of the stored feature extraction step while shifting the window upon which attention is focused; and

a signal detection decision step in which, by comparing together the distance which has been produced by the feature matching step and a search threshold, which is a threshold which corresponds to the distance, it is decided whether or not the reference signal is present at the location within the stored signal,

wherein the processing of the feature matching step and the processing of the signal detection decision step are repeated while shifting the window upon which attention is focused.

10. (original) A signal retrieval method as described in Claim 9, further comprising:

a distance re-calculation step in which, for the location in the database signal at which it has been decided by the signal detection decision step that the query signal is present, the distance between the feature sequence which has been produced by the reference feature extraction step and the feature sequence which has been produced by the stored feature extraction step is calculated; and

a signal detection re-decision step in which, by comparing together the distance which has been produced by the distance re-calculation step and the search threshold, it is re-decided whether or not the query signal is present at the location of the database signal,

wherein the processing of the feature matching step, the signal detection decision step, the distance re-calculation step, and the signal detection re-decision step is repeated while shifting the window upon which attention is focused; for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal.

11. (original) A signal retrieval method as described in Claim 9, further comprising a skip width calculation step in which, based upon the distance which has been calculated by the feature matching step, a skip width for the window upon which attention is focused is calculated, and the window upon which attention is focused is shifted by the skip width,

wherein the processing of the feature matching step, the signal detection decision step, and the skip width calculation step is repeated while shifting the window upon which attention is focused; for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal.

12. (previously presented) A signal compression device which compresses an original signal which is provided in advance and which is represented as a sequence of multi-dimensional vectors to convert the original signal into a compressed signal, comprising:

an initial sub-signal creation section embodied as computer executable instructions in a computer memory which creates sub-signals by dividing the original signal into the sub-signals in a time domain so as not to overlap with each other;

a created sub-signal selection section embodied as computer executable instructions in a computer memory which, for each of the sub-signals which have been produced by the initial sub-signal creation section, sets a segmentation boundary shiftable range which includes a segmentation boundary between the sub-signals produced by the initial sub-signal creation section, calculates an average value of dimensionality of compressed signals which are obtained from the sub-signals produced by the initial sub-signal creation section, and extracts segmentation boundary candidates from the segmentation boundary shiftable range, the average value of dimensionality of compressed signals which are obtained from sub-signals which are determined by each of the segmentation boundary candidates being smaller than the

average value of dimensionality of the compressed signals which are obtained from the sub-signals produced by the initial sub-signal creation section;

a sub-signal re-creation section embodied as computer executable instructions in a computer memory which, using the segmentation boundary candidates which have been produced by the created sub-signal selection section, determines upon a created sub-signal which is actually to be used;

a compression mapping determination section embodied as computer executable instructions in a computer memory which determines upon different mappings for calculation of a compressed signal corresponding to the respective sub-signals, from only the respective sub-signals which has been obtained by the sub-signal re-creation section; and

a signal compression section embodied as computer executable instructions in a computer memory which calculates a compressed signal which corresponds to each of the sub-signals which have been obtained by the sub-signal re-creation section, based upon the mappings which have been obtained by the compression mapping determination section, to reduce the dimensionality of each of the multi-dimensional vectors in each unit time.

13. (previously presented) A signal retrieval device for, at any location within a stored signal, which is an original signal which is registered in advance, calculating the distance from a reference signal, which is a signal which is taken as an object, and finding a location from the stored signal which is similar to the reference signal, comprising:

the sections which are comprised in the signal compression device as described in Claim 12;

a reference feature extraction section embodied as computer executable instructions in a computer memory which produces a feature from the reference signal;

a stored feature extraction section embodied as computer executable instructions in a computer memory which sets a window upon which attention is focused within the stored signal, and which produces a feature from the stored signal within the window upon which attention is focused;

a reference feature compression section embodied as computer executable instructions in a computer memory which compresses a reference feature which has been produced by the reference feature extraction section, based upon the mappings which have been produced by the compression mapping determination section;

a feature matching section embodied as computer executable instructions in a computer memory which calculates the distance between a reference compressed signal which has been produced by the reference feature compression section and a stored compressed signal which has been produced from the signal compression section by newly using the feature sequence which has been produced by repeatedly performing the processing by the stored feature extraction section while shifting the window upon which attention is focused; and

a signal detection decision section embodied as computer executable instructions in a computer memory which, by comparing together the distance which has been produced by the feature matching section and a search threshold, which is a threshold which corresponds to the distance, decides whether or not the reference signal is present at the location within the stored signal,

wherein the operation of the feature matching section and the operation of the signal detection decision section are repeated while shifting the window upon which attention is focused.

14. (previously presented) A signal retrieval device as described in Claim 13, further comprising:

a distance re-calculation section embodied as computer executable instructions in a computer memory which, for the location in the database signal at which it has been decided by the signal detection decision section that the query signal is present, calculates the distance between the feature sequence which has been produced by the reference feature extraction section and the feature sequence which has been produced by the stored feature extraction section; and

a signal detection re-decision section embodied as computer executable instructions in a computer memory which, by comparing together the distance which has been produced by the distance re-calculation section and the search threshold, re-decides whether or not the query signal is present at the location of the database signal,

wherein the processing of the feature matching section, the signal detection decision section, the distance re-calculation section, and the signal detection re-decision section is repeated while shifting the window upon which attention is focused; for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal.

15. (previously presented) A signal retrieval device as described in Claim 13, further comprising a skip width calculation section embodied as computer executable instructions in a computer memory which, based upon the distance which has been calculated by the feature matching section, calculates a skip width for the window upon which attention is focused, and shifts the window upon which attention is focused by the skip width, and

wherein the processing of the feature matching section, the signal detection decision section, and the skip width calculation section is repeated while shifting the window upon which attention is focused; for some locations within the

database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal.

16 – 28. (cancelled)

29. (previously presented) A signal retrieval method which finds out portions from a database video signal which has been registered in advance which are similar to a query signal which is taken as an object, comprising:

a query feature extraction step in which a feature is produced from the query signal;

a database feature extraction step in which a window upon which attention is focused is set within the database video signal, and in which a feature is produced from the database video signal within the window upon which attention is focused, wherein the database video signal represents a sequence of images of a physical domain captured by an imaging device;

a database feature partitioning step in which a feature sequence which has been produced by repeatedly performing the database feature extraction step while shifting the window upon which attention is focused is partitioned in a time domain;

a database feature pruning step in which a representative feature is extracted from the feature sequence which has been obtained after partitioning by the database feature partitioning step, and a representative feature sequence is produced which consists of a smaller number of features;

a feature region extraction step in which a region is produced in which a feature which is included in the partition which has been produced by the database feature partitioning step is present;

a feature matching step in which a distance is calculated between a feature sequence which has been produced by the query feature extraction step and a representative feature sequence which has been produced by the database feature pruning step;

a distance compensation step in which the distance which has been calculated by the feature matching step is compensated using the region which has been produced by the feature region extraction step;

a signal detection decision step in which, by comparing together the distance which has been produced after compensation by the distance compensation step and a search threshold, which is a threshold which corresponds to the distance, it is decided whether or not the query signal is present at the location within the database video signal;

a segment extraction step in which segments, which are sub-sequences, are extracted by segmenting a feature sequence which has been produced by repeatedly performing the database feature extraction step while shifting the window upon which attention is focused;

a compression mapping determination step in which, from each of the segments which have been obtained by the segment extraction step, a mapping is determined for calculation of a feature of less dimensions than the feature;

a database feature compression step in which a feature which corresponds to a segment which has been obtained by the segment extraction step and which is of less dimensions than the feature is calculated based upon the mapping which has been obtained by the compression mapping determination step; and

a query feature compression step in which a feature which corresponds to a feature which has been obtained by the query feature extraction step and which is of less dimensions than the feature is calculated based upon the mapping which has been obtained by the compression mapping determination step,

wherein the processing of the feature matching step through the signal detection decision step is repeated while shifting the window upon which attention is focused, for some locations within the database video signal, the distance from the query signal is calculated, and it is determined whether or not the query signal is present at the locations within the database video signal, and

in the database feature pruning step, a representative feature sequence is produced by taking the compressed feature sequence which has been produced by the database feature compression step as a new feature sequence, and, in the feature matching step, a matching is performed of the compressed feature which has been produced by the query feature compression step as a new feature, the processing of the feature matching step through the signal detection decision step is repeated while shifting the window upon which attention is focused, for some locations within the database video signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database video signal.

30. (original) A signal retrieval method as described in Claim 29, wherein the database feature compression step comprises:

a database feature mapping step in which a segment which has been obtained by the segment extraction step is mapped according to the mapping which has been obtained by the compression mapping determination step;

a database projection distance calculation step in which, for the compressed feature sequence which has been produced by the database feature mapping step, the distance from the feature sequence which has been produced by the database feature extraction step is calculated; and

a database compressed feature creation step in which a new compressed feature sequence is created from the compressed feature sequence which has been produced by the database feature mapping step and the projection distance which has been produced by the database projection distance calculation step, and wherein

the query feature compression step comprises:

a query feature mapping step in which the feature which has been obtained by the query feature extraction step is mapped according to the mapping which has been obtained by the compression mapping determination step;

a query projection distance calculation step in which, for the compressed feature which has been produced by the query feature mapping step, the distance from the feature which has been produced by the query feature extraction step is calculated; and

a query compression feature creation step in which a new compressed feature is created from the compressed feature which has been produced by the query feature mapping step and the projection distance which has been produced by the query projection distance calculation step.

31. (original) A signal retrieval method as described in Claim 29, wherein the compression mapping determination step extracts a representative feature by a Karhunen-Loeve transform.

32. (previously presented) A signal retrieval method as described in Claim 29, further comprising:

a distance re-calculation step in which, for the location in the database video signal at which it has been decided by the signal detection decision step that the query signal is present, the distance between the feature which has been produced by the query feature extraction step and the feature sequence which has been produced by the database feature extraction step is calculated; and

a signal detection re-decision step in which, by comparing together the distance which has been produced by the distance re-calculation step and the search threshold, it is again decided whether or not the query signal is present at the location of the database video signal, and

wherein the processing of the feature matching step, the signal compensation step, the signal detection decision step, the distance re-calculation step, and the signal detection re-decision step is repeated while shifting the window upon which attention is focused, for some locations within the database video signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database video signal.

33. (cancelled)

34. (original) A signal retrieval method as described in Claim 29, further comprising:

a database feature classification step in which the respective features which have been produced by repeatedly performing the database feature extraction step while shifting the window upon which attention is focused are classified based upon a distance which has been defined in advance, and a representative feature of the classification is determined upon;

a selection threshold setting step in which a selection threshold for the distance which has been defined by the database feature classification step is calculated from a search threshold which has been defined in advance; and

a database feature selection step in which, among the classification which has been produced by the database feature classification step, a feature is selected which is included in the classification which contains a representative feature such that the distance from the feature which has been produced by the query feature extraction step satisfies a condition which is produced from the selection threshold which has been calculated by the selection threshold setting step.

35 – 36. (cancelled)

37. (original) A signal retrieval method as described in Claim 30, wherein the database projection distance calculation step calculates the distance based upon Manhattan distance or Euclid distance.

38. (cancelled)

39. (previously presented) A signal retrieval method as described in Claim 29, wherein the query feature extraction step and the database feature extraction step classify the features by a method which is determined in advance, create a histogram which is a frequency distribution table for each classification, and output the histogram as a new feature.

40. (previously presented) A signal retrieval method as described in Claim 29, further comprising a skip width calculation step in which, based upon the distance which has been calculated by the distance compensation step, a skip width for the window upon which attention is focused is calculated, and the window upon which attention is focused is shifted by the skip width, and

wherein the processing of the feature matching step, the distance compensation step, the signal detection decision step, and the skip width calculation step is repeated while shifting the window upon which attention is focused, for some locations within the database video signal, the distance from the query signal is calculated, and it is determined whether or not the query signal is present at the locations within the database video signal.

41. (previously presented) A signal retrieval method which finds out portions from a database video signal which has been registered in advance which are similar to a query signal which is taken as an object, comprising:

a query feature extraction step in which a feature is produced from a query signal;

a database feature extraction step in which a window upon which attention is focused is set within the database video signal, and in which a feature is produced from the database video signal within the window upon which attention is focused, wherein the database video signal represents a sequence of images of a physical domain captured by an imaging device;

a database feature classification step in which the respective features which have been produced by repeatedly performing the database feature extraction step while shifting the window upon which attention is focused are classified based upon a distance which has been defined in advance, and a representative feature of the classification is determined upon;

a selection threshold setting step in which a selection threshold for the distance which has been defined by the database feature classification step is calculated from a search threshold which has been defined in advance;

a database feature selection step in which, among the classification which has been produced by the database feature classification step, a feature is selected which is included in the classification which contains a representative feature such that the distance from the feature which has been produced by the query feature extraction step satisfies a condition which is produced from the selection threshold which has been calculated by the selection threshold setting step;

a segment extraction step in which segments, which are sub-sequences, are extracted by segmenting a feature sequence which has been produced by

repeatedly performing the database feature extraction step while shifting the window upon which attention is focused;

a compression mapping determination step in which, from each of the segments which have been obtained by the segment extraction step, a mapping is determined for calculation of a feature of less dimensions than the feature;

a database feature compression step in which a feature which corresponds to a segment which has been obtained by the segment extraction step and which is of less dimensions than the feature is calculated based upon the mapping which has been obtained by the compression mapping determination step;

a query feature compression step in which a feature which corresponds to a feature which has been obtained by the query feature extraction step and which is of less dimensions than the feature is calculated based upon the mapping which has been obtained by the compression mapping determination step;

a feature matching step in which a distance is calculated between a compressed feature sequence which has been produced by the database feature compression step and a compressed feature which has been produced by the query feature extraction step; and

a signal detection decision step in which, by comparing together the distance which has been calculated by the feature matching step and a search threshold, which is a threshold which corresponds to the distance, it is decided whether or not the query signal is present at the location within the database video signal, and

wherein the processing of the feature matching step and the signal detection decision step is repeated while shifting the window upon which attention is focused, for some locations within the database video signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database video signal, and

the segment extraction step comprises;

an initial sub-sequence creation step of creating sub-sequences by dividing the feature sequence into the sub-sequences in a time domain so as not to overlap with each other;

a created sub-sequence selection step of, for each of the sub-sequences which have been produced by the initial sub-sequence creation step, pruning the created sub-sequence candidates having different lengths to those which reduce an amount of data of the compressed feature sequence; and

a sub-sequence re-creation step of determining upon a created sub-sequence which is actually to be used, using the created sub-sequence candidates which have been produced by the created sub-sequence selection step.

42. (previously presented) A signal retrieval method as described in Claim 41, further comprising:

a distance re-calculation step in which, for the location in the database video signal at which it has been decided by the signal detection decision step that the query signal is present, the distance between the feature which has been produced by the query feature extraction step and the feature sequence which has been produced by the database feature extraction step is calculated; and

a signal detection re-decision step in which, by comparing together the distance which has been produced by the distance re-calculation step and the search threshold, it is again decided whether or not the query signal is present at the location of the database video signal, and

wherein the processing of the feature matching step, the signal detection decision step, the distance re-calculation step, and the signal detection re-decision step is repeated while shifting the window upon which attention is focused, for some locations within the database video signal, the distance from the query signal is

calculated; and it is determined whether or not the query signal is present at the locations within the database video signal.

43. (previously presented) A signal retrieval method as described in Claim 41, further comprising a skip width calculation step in which, based upon the distance which has been calculated by the feature matching step, a skip width for the window upon which attention is focused is calculated, and the window upon which attention is focused is shifted by the skip width, and

wherein the processing of the feature matching step, the signal detection decision step, and the skip width calculation step is repeated while shifting the window upon which attention is focused, for some locations within the database video signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database video signal.

44. (cancelled)

45. (previously presented) A signal retrieval device which finds out portions from a database signal which has been registered in advance which are similar to a query signal which is taken as an object, comprising:

a query feature extraction section embodied as computer executable instructions in a computer memory which produces a feature from the query signal;

a database feature extraction section embodied as computer executable instructions in a computer memory which sets a window upon which attention is focused is set within the database signal, and which produces a feature from the database signal within the window upon which attention is focused;

a database feature partitioning section embodied as computer executable instructions in a computer memory which partitions a feature sequence in a time domain

which has been produced by repeatedly performing the processing of the database feature extraction section while shifting the window upon which attention is focused;

a database feature pruning section embodied as computer executable instructions in a computer memory which extracts a representative feature from the feature sequence which has been obtained after partitioning by the database feature partitioning section, and which produces a representative feature sequence which consists of a smaller number of features;

a feature region extraction section embodied as computer executable instructions in a computer memory which produces a region in which a feature which is included in the partition which has been produced by the database feature partitioning section is present;

a feature matching section embodied as computer executable instructions in a computer memory which calculates a distance between a feature sequence which has been produced by the query feature extraction section and a representative feature sequence which has been produced by the database feature pruning section;

a distance compensation section embodied as computer executable instructions in a computer memory in which the distance which has been calculated by the feature matching section is compensated using the region which has been produced by the feature region extraction section;

a signal detection decision section embodied as computer executable instructions in a computer memory in which, by comparing together the distance which has been produced after compensation by the distance compensation section and a search threshold, which is a threshold which corresponds to the distance, it is decided whether or not the query signal is present at the location within the database signal;

a segment extraction section embodied as computer executable instructions in a computer memory which extracts segments, which are sub-sequences, by segmenting a feature sequence which has been produced by repeatedly performing the processing of the database feature extraction section while shifting the window upon which attention is focused;

a compression mapping determination section embodied as computer executable instructions in a computer memory which, from each of the segments which have been obtained by the segment extraction section, determines a mapping for calculation of a feature of less dimensions than the feature;

a database feature compression section embodied as computer executable instructions in a computer memory which calculates a feature which corresponds to a segment which has been obtained by the segment extraction section and which is of less dimensions than the feature based upon a mapping which has been obtained by the compression mapping determination section; and

a query feature compression section embodied as computer executable instructions in a computer memory which calculates a feature which corresponds to a feature which has been obtained by the query feature extraction section and which is of less dimensions than the feature based upon a mapping which has been obtained by the compression mapping determination section,

wherein the processing of the feature matching section through the signal detection decision section is repeated while shifting the window upon which attention is focused; for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal, and

by the database feature pruning section, a representative feature sequence is produced by using a compressed feature sequence which has been produced by the database feature compression section is produced as a new feature sequence; by the feature matching section, matching is performed using a compressed feature which has been produced by the query feature compression section as a new feature; and further: the processing of the feature matching section through the signal detection decision section is repeated while shifting the window upon which attention is focused, for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal.

46 – 48. (cancelled)

49. (previously presented) A signal retrieval device which finds out portions from a database signal which has been registered in advance which are similar to a query signal which is taken as an object, comprising:

a query feature extraction section embodied as computer executable instructions in a computer memory which produces a feature from a query signal;

a database feature extraction section embodied as computer executable instructions in a computer memory which sets a window upon which attention is focused within the database signal, and which produces a feature from the database signal within the window upon which attention is focused;

a database feature classification section embodied as computer executable instructions in a computer memory which classifies the respective features which have been produced by repeatedly performing the processing of the database feature extraction section while shifting the window upon which attention is focused based upon a distance which has been determined in advance, and determines upon a representative feature of the classification;

a selection threshold setting section embodied as computer executable instructions in a computer memory which calculates a selection threshold for the distance which has been defined by the database feature classification section from a search threshold which has been defined in advance;

a database feature selection section embodied as computer executable instructions in a computer memory which, among the classification which has been produced by the database feature classification section, selects a feature which is included in the classification which contains a representative feature such that the distance from the feature which has been produced by the query feature extraction

section satisfies a condition which is produced from the selection threshold which has been calculated by the selection threshold setting section;

a segment extraction section embodied as computer executable instructions in a computer memory which extracts segments, which are sub-sequences, by segmenting a feature sequence which has been produced by repeatedly performing the processing of the database feature extraction section while shifting the window upon which attention is focused;

a compression mapping determination section embodied as computer executable instructions in a computer memory which, from each of the segments which have been obtained by the segment extraction section, determines a mapping for calculation of a feature of less dimensions than the feature;

a database feature compression section embodied as computer executable instructions in a computer memory which calculates a feature which corresponds to a segment which has been obtained by the segment extraction section and which is of less dimensions than the feature based upon a mapping which has been obtained by the compression mapping determination section;

a query feature compression section embodied as computer executable instructions in a computer memory which calculates a feature which corresponds to a feature which has been obtained by the query feature extraction section and which is of less dimensions than the feature based upon the mapping which has been obtained by the compression mapping determination section;

a feature matching section embodied as computer executable instructions in a computer memory which calculates a distance between a compressed feature sequence which has been produced by the database feature compression section and a compressed feature which has been produced by the query feature extraction section; and

a signal detection decision section embodied as computer executable instructions in a computer memory which, by comparing together the distance which

has been calculated by the feature matching section and a search threshold, which is a threshold which corresponds to the distance, decides whether or not the query signal is present at the location within the database signal, and

wherein the processing of the feature matching section through the signal detection decision section is repeated while shifting the window upon which attention is focused, for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal, and

the segment extraction section comprises:

an initial sub-sequence creation section which creates sub-sequences by dividing the feature sequence into the sub-sequences in a time domain so as not to overlap with each other;

a created sub-sequence selection section which, for each of the sub-sequences which have been produced by the initial sub-sequence creation section, prunes the created sub-sequence candidates having different lengths to those which reduce an amount of data of the compressed feature sequence; and

a sub-sequence re-creation section which determines upon a created sub-sequence which is actually to be used, using the created sub-sequence candidates which have been produced by the created sub-sequence selection section.

50. (previously presented) A signal retrieval device as described in Claim 49, further comprising:

a distance re-calculation section embodied as computer executable instructions in a computer memory which, for the location in the database signal at which it has been decided by the signal detection decision section that the query signal is present, calculates the distance between the feature sequence which has been

produced by the query feature extraction section and the feature sequence which has been produced by the database feature extraction section; and

a signal detection re-decision section embodied as computer executable instructions in a computer memory which, by comparing together the distance which has been produced by the distance re-calculation section and the search threshold, again decides whether or not the query signal is present at the location of the database signal and

wherein the processing of the feature matching section, the signal detection decision section, the distance re-calculation section, and the signal detection re-decision section is repeated while shifting the window upon which attention is focused, for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal.

51. (previously presented) A signal retrieval device as described in Claim 49, further comprising a skip width calculation section embodied as computer executable instructions in a computer memory which, based upon the distance which has been calculated by the feature matching section, calculates a skip width for the window upon which attention is focused, and shifts the window upon which attention is focused by the skip width and

wherein the processing of the feature matching section, the signal detection decision section, and the skip width calculation section is repeated while shifting the window upon which attention is focused; for some locations within the database signal, the distance from the query signal is calculated; and it is determined whether or not the query signal is present at the locations within the database signal.

52 – 67. (cancelled)